EUROPEAN COMMISSION
Information Society and Media Directorate General

Lisbon Strategy and Policies for the Information Society
Lisbon Strategy and i2010

Use of Computers and the Internet in Schools in Europe 2006

Country Brief: Norway

6 / 2006

Key findings

All Norwegian schools now use computers for teaching and have internet access. A very high 89% use the internet via a broadband connection. With this figure Norway ranks at number 7 of the 27 countries participating in the survey.

There is some variation between school types: while an already remarkable and very high 87% of primary schools have a broadband internet connection, the penetration is highest among upper secondary schools, with 97% and vocational schools (95%). There is also some variation with regard to broadband access between urban and rural areas: 94% of schools in densely populated areas have broadband access compared to 88% of schools in thinly populated areas.

In Norway there are 24 computers per 100 pupils with the upper level schools providing around 40 computers per 100 pupils resulting in almost one computer for two pupils which again compares to one computer for 20 pupils in the European countries at the tail end.

84% of the Norwegian schools using computers for teaching use them in classrooms with the highest percentage being achieved in primary schools (89%).

Computer labs are also popular and provided in 82% of Norwegian schools. The 100% figure is reached in upper secondary schools and in almost 100% of vocational schools.

83% of teachers have integrated the use of ICT into the teaching of most of their subjects, placing Norway at rank 7 in Europe.

A very high 89% of Norwegian classroom teachers had used computers in class in the 12 months prior to the survey, with very little variation across school types and between urban and rural areas. Primary school teachers make heaviest use of ICT in class (90%).

Norwegian teachers, like their Swedish counterparts, are not the most frequent and intensive users of ICT in class.

A majority (59%) of teachers using computers use them in less than 10% of all lessons. Only a low 4% state that they use computers in more than half of their lessons.

Older teachers (indicator used here: years of teaching experience) in Norway make use of computers and the internet in schools almost as frequently as their younger colleagues.

Only 11% of teachers do not use computers in class in Norway. Asked for the most important barrier, three issues gain the highest ratings among this group of teachers: 50% state a lack of computers in their schools as an important barrier, 33% give lack of adequate material as a reason and 22% of those not using ICT are not convinced of any benefits of using computers in class

A majority of Norwegian teachers are more or less satisfied with the technical access means at their schools. Highest satisfaction rates can be found in vocational schools (90%).

A very high 73% wish there were better support and maintenance actions taken. This is especially the case in primary schools with 76% of the teachers stating this as an issue.

A very high number of teachers (64%) state that teachers in their school lack the necessary ICT skills.

A high 83% state that the use of ICT in class results in significant learning benefits for pupils.

Although Norwegian schools are very well equipped with ICT motivation seems to be an issue, although not a real problem. 14% of the teachers (the same as for the EU25) lack motivation for ICT use in class.

Finally, and despite the high levels of ICT in schools, a very high number of teachers (73%) demand better ICT maintenance and support in their schools, pointing to an area where there is some need for improvement in Norwegian schools, especially in primary schools.

ICT Equipment and Internet in Schools

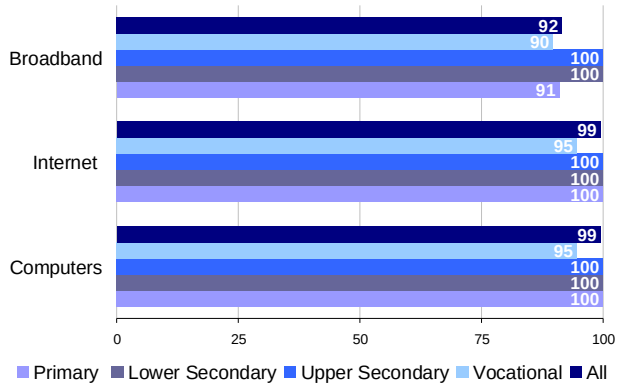
All Norwegian schools now use computers for teaching and have internet access. A very high 89% use the internet via a broadband connection. With this figure Norway ranks at number 7 of the 27 countries participating in the survey.

There is some variation between school types: while an already remarkable and very high 87% of primary schools have a broadband internet connection, the penetration is highest among upper secondary schools, with 97% and vocational schools (95%). There is also some variation with regard to broadband access between urban and rural areas: 94% of schools in densely populated areas have broadband access compared to 88% of schools in thinly populated areas.

82% of schools have a website, 79% offer e-mail to teachers, and 31% do so to pupils.

84% of the Norwegian schools using computers for teaching use them in classrooms with the highest percentage being achieved in primary schools (89%). Computers in the school library are also common in more than half of the schools, probably as an additional location for accessing the internet by pupils when not in class.

Percentage of Schools Using Computers, Internet Connection, and Broadband Internet Access According to School Type in Norway 2006



Source: *LearnInd HTS 2006;* ***Base:*** *All schools;* ***Question:*** *Computers: Q6; Internet, Broadband: Q9. See questionnaire for exact wording.*

Computer labs are also popular and provided in 82% of Norwegian schools. The 100% figure is reached in upper secondary schools and in almost 100% of vocational schools, according to the statements made by Norwegian head teachers.

Those schools with a broadband connection to the internet are much more likely to have a more sophisticated ICT infrastructure including a school website, the use of a LAN or the availability of an intranet.

The use of Computers and the Internet in Schools

Computers are used for various purposes and as part of teaching different subjects in schools but also and very widely as a separate subject.

Computer sciences are taught as a separate subject in 73% of Norwegian schools. Very high figures are reached in upper secondary schools (85%) and in vocational schools (79%), according to the statements made by Norwegian head teachers.

83% of teachers have integrated the use of ICT into the teaching of most of their subjects which puts Norway at rank 7 in Europe. ICT Usage does not vary much between school types.

A very high 89% of Norwegian classroom teachers had used computers in class in the 12 months prior to the survey, with very little variation across school types and between urban and rural areas. Primary school teachers make heaviest use of ICT in class (90%).

For most teachers, this includes not only using a computer for presentation purposes but also the use of computers by pupils in class.

Norwegian teachers, like their Swedish counterparts, are not the most frequent and intensive users of ICT in class.

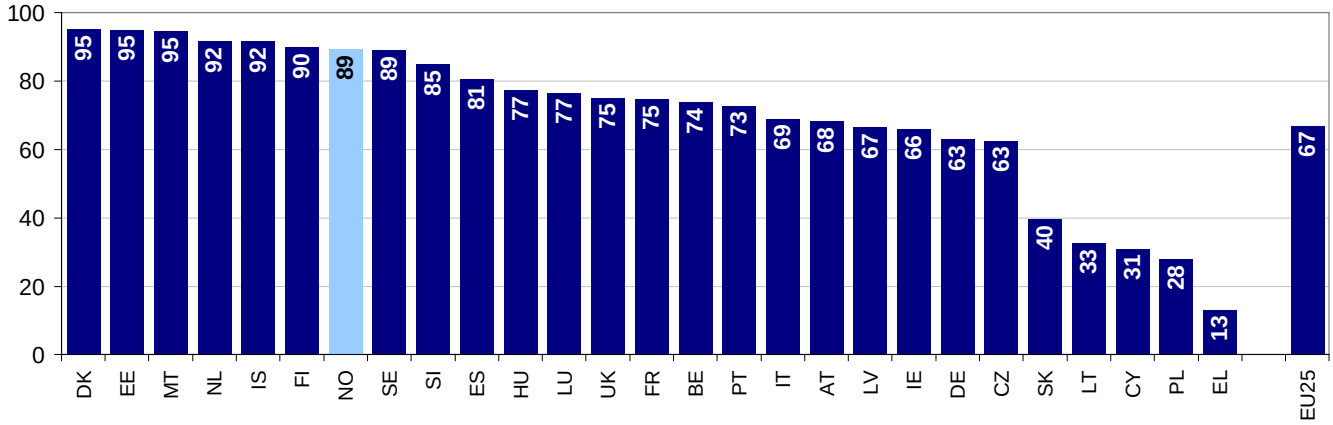
A majority (59%) of these teachers using computers use them in less than 10% of all lessons. Only a low 4% state that they use computers in more than half of their lessons. Teachers in vocational schools use computers in class much more frequently than their colleagues in general education, with almost 45% using computers in more than a quarter of their lessons compared to for instance only 16% in primary schools.

ICT equipment in Norwegian schools 2006

			Educational Level (NO)				Type of locality (NO)			Internet Access (NO)	
	Total NO	Total EU25	Primary	Lower secondary	Upper secondary	Vocational	Densely populated	Inter-mediate	Thinly populated	Narrow-band	Broadband
Computers per 100 pupils [a]	24.2	11.3	18.1	21.9	40.9	38.8	22.8	26.2	24.0	23.5	24.3
... of which internet connected	22.7	9.9	16.0	20.5	39.9	38.6	21.7	24.4	22.4	21.0	22.8
Percentage of schools having...											
Computers for teaching [b]	99.8	98.7	99.7	100.0	100.0	100.0	100.0	100.0	99.7	100.0	100.0
Internet access [c]	99.8	96.2	99.7	100.0	100.0	100.0	100.0	100.0	99.7	100.0	100.0
Broadband internet access [d]	89.4	66.9	87.0	91.1	96.5	94.7	93.6	90.7	88.4	0.0	100.0
A website [e]	81.6	63.0	77.2	76.6	100.0	100.0	96.8	94.6	76.2	66.5	83.6
An e-mail address for the majority of teachers [f]	79.3	65.2	75.4	76.1	95.0	94.3	98.5	87.7	74.0	49.8	82.9
An e-mail address for the majority of pupils [g]	31.0	23.5	26.9	33.2	40.1	42.1	57.1	29.3	26.6	16.4	32.7
A LAN [h]	59.3	55.2	55.0	60.0	90.1	85.5	67.0	54.0	59.1	57.1	59.7
An intranet [i]	46.0	40.8	42.4	50.0	60.1	61.1	43.4	56.0	44.4	31.9	47.8
An external support or maintenance contract [j]	32.4	47.1	30.2	39.7	35.9	36.0	43.5	32.8	30.3	33.5	32.3
Percentage of schools using computers for education in...											
Computer labs [k]	81.7	80.5	76.7	84.1	100.0	94.7	90.3	88.8	78.6	73.5	82.7
Classrooms [l]	84.0	61.4	89.0	79.4	72.6	68.7	88.8	87.2	82.4	84.6	83.9
School library [m]	54.4	33.4	52.0	52.5	68.4	73.4	71.3	61.3	49.8	44.1	55.6
Other locations accessible for pupils [n]	56.5	27.0	50.4	68.7	70.0	69.9	59.0	60.3	55.2	56.5	56.5

Source: *LearnInd HTS 2006;* ***Base:*** *a: all pupils; b-j: all schools, k-n: schools using computers for educational purposes for pupils (cf. index b);* ***Question:*** *a: Q4, Q6, Q7; b: Q6; c: Q9; d: Q9; e-j: Q12; k-n: Q8. See questionnaire for exact wording.*

Percentage of Schools with Broadband Internet Access in Europe 2006



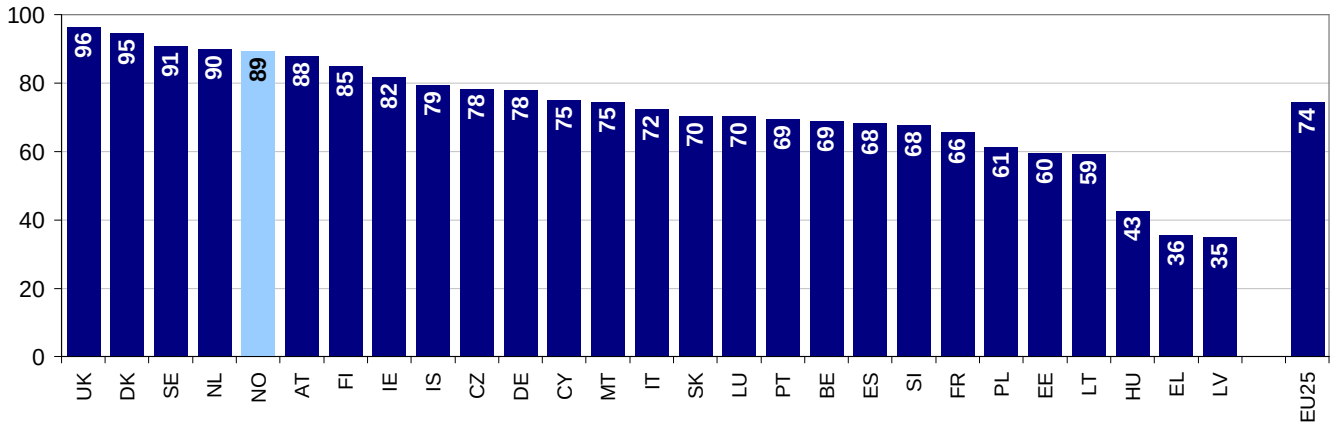
Source: *LearnInd HTS 2006;* ***Base:*** *All schools;* ***Question:*** *Q9. See questionnaire for exact wording.*

Use of computers in class in Norway 2006

Assessments of the head teacher		Total NO	Total EU25	Educational Level (NO)				Type of locality (NO)			Internet Access (NO)	
				Primary	Lower secondary	Upper secondary	Vocational	Densely populated	Inter-mediate	Thinly populated	Narrow-band	Broadband
Computer sciences taught as separate subject	Agree	72.5	54.7	72.8	66.8	85.1	78.7	76.2	80.7	70.1	67.1	73.1
	Disagree	26.5	43.7	26.4	32.1	14.9	19.5	22.4	18.0	29.1	28.8	26.3
	Don't know	1.0	1.6	0.8	1.1	0.0	1.8	1.4	1.3	0.8	4.2	0.6
Computers and the internet are integrated into teaching of most subjects	Agree	82.7	75.3	81.0	88.7	90.7	86.3	84.9	84.2	82.0	80.6	82.9
	Disagree	17.3	24.1	19.0	11.3	9.3	13.7	15.1	15.8	18.0	19.4	17.1
	Don't know	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
used for teaching traditional subjects or basic skills	Agree	90.6	75.8	92.3	90.1	87.6	85.2	90.0	89.9	90.9	84.3	91.4
	Disagree	9.0	22.8	7.1	9.9	12.4	14.8	10.0	8.8	8.8	13.8	8.4
	Don't know	0.4	1.4	0.5	0.0	0.0	0.0	0.0	1.3	0.2	2.0	0.2
used for teaching foreign languages	Agree	79.8	56.6	76.7	84.1	92.6	91.6	90.1	74.7	79.1	70.4	80.9
	Disagree	17.5	40.1	19.8	14.2	7.4	6.5	5.0	21.3	18.9	25.1	16.6
	Don't know	2.7	3.3	3.5	1.7	0.0	1.8	4.9	4.0	2.0	4.4	2.5
used for teaching students with special needs/ handicaps	Agree	97.5	71.7	97.4	97.1	98.4	94.9	98.5	98.7	97.0	98.2	97.4
	Disagree	1.5	23.7	1.5	1.2	1.6	5.1	0.0	1.3	1.8	0.0	1.7
	Don't know	1.0	4.6	1.2	1.8	0.0	0.0	1.5	0.0	1.1	1.8	0.9

Source: *LearnInd HTS 2006;* ***Base:*** *All schools using computers for educational purposes for pupils;* ***Question:*** *Q13: "To what extent do you agree or disagree with the following statements regarding the educational use of computers and/or the internet in your school?"*

Percentage of teachers who have used computers in class in the last 12 months (2006)



Source: *LearnInd CTS 2006;* ***Base:*** *All teachers;* ***Question:*** *Q7. See questionnaire for exact wording*

Teachers' use of computers in class in Norway 2006

Percentage of teachers who ...	Total NC	Total EU25	Educational Level (NO)				Type of locality (NO)			Years of teaching experience (NO)			
			Primary	Lower secon-dary	Upper secon-dary	Voca-tional	Densely popu-lated	Inter-mediate	Thinly popu-lated	<5 y	5-9 y	10-19 y	20+ y
...have used computers in class[1]	89.4	74.3	90.4	89.4	79.4	82.4	86.0	86.1	90.6	91.4	90.8	91.8	86.7
...use a computer in class to present or demonstrate	68.9	63.4	66.5	71.9	70.9	70.5	72.0	68.9	68.3	72.9	66.1	73.5	66.7
...have pupils use a computer in class	86.2	66.3	87.6	88.0	72.8	77.2	82.5	82.0	87.8	87.3	88.2	88.5	83.6

Source: *LearnInd CTS 2006;* ***Base:*** *All teachers;* ***Question:*** *Q7 "How have you used computers and/or the internet for work in the last 12 months?"*

Norwegian teachers using computers do not restrict themselves to a particular source of information but use a multitude of different material from a variety of sources for teaching purposes which in most categories is around the European average. They are also very active (86%) in searching for material themselves in the internet. This shows a very proactive behaviour.

Offline learning materials such as CD-ROMs are used to a lesser extent and mostly in primary schools.

Older teachers (indicator used here: years of teaching experience) in Norway make use of computers and the internet in schools almost as frequently as their younger colleagues. 22% of those with 5% of teaching experience belong to the heavy users using ICT in more than a quarter of lessons, which compares to 17% of those with more than 20 years of teaching experience.

Only 11% of teachers in Norway do not use computers in class. When asked for the most important barrier, three issues gain the highest ratings among this group of teachers: 50% state a lack of computers in their schools as an important barrier, 33% give lack of adequate material as a reason and 22% not using ICT are not convinced of any benefits of using computers in class. The latter is most prominent in lower level schools.

This results in a situation where the statement “lack of equipment in school” is expressed by a very low 11% of all Norwegian teachers (11% non-users multiplied with 50% of teachers agreeing to this item).

Frequency of computers use in class in Norway 2006

Percentage of all teachers *using computers in class* who ...	Total NC	Total EU25	Educational Level (NO)				Type of locality (NO)			Years of teaching experience (NO)			
			Primary	Lower secon-dary	Upper secon-dary	Voca-tional	Densely popu-lated	Inter-mediate	Thinly popu-lated	<5 y	5-9 y	10-19 y	20+ y
...use computers in 5% and less of all lessons	27.5	18.5	30.3	25.4	14.6	12.0	19.3	29.9	28.4	28.5	19.8	34.7	27.3
in 6 to 10% of lessons	31.5	22.5	33.5	29.0	23.5	19.1	23.0	32.8	32.7	27.6	27.0	30.5	35.9
in 11 to 24% of lessons	21.8	22.2	20.0	25.4	23.3	23.7	23.0	20.3	21.8	22.0	32.1	15.2	19.7
in 25 to 50% of lessons	15.0	20.2	14.6	18.9	11.9	17.4	25.6	10.4	14.1	16.8	19.2	12.6	13.4
more than 50% of lessons	4.3	16.5	1.4	1.3	26.6	27.8	9.0	6.5	3.0	5.1	1.9	7.0	3.7

Source: *LearnInd CTS 2006;* ***Base:*** *Teachers using computers in class, "don't know" answers excluded;* ***Question:*** *Q9 "For what percentage of time have you used computers and/or the internet in class when teaching your main subject(s) in the past 12 months?"*

Source of educational material used in class in Norway 2006

Percentage of all teachers *using computers in class*[2] who ...	**Total NO**	**Total EU25**	**Educational Level**				**Type of locality**		
			Primary	**Lower secondary**	**Upper secondary**	**Vocational**	**Densely populated**	**Inter-mediate**	**Thinly populated**
...use material they have searched the internet for	85.8	82.7	85.2	88.5	89.2	84.9	88.5	91.3	84.2
...use existing online material from established educational sources	71.2	74.2	71.5	69.0	73.7	71.7	82.4	69.5	69.6
...use material that is available on the school's computer network or database	66.5	63.1	67.1	62.7	65.2	66.4	71.3	70.3	64.9
...use electronic offline material (such as CD ROMS)	60.5	83.0	64.3	59.2	49.2	54.8	48.3	53.3	64.1
...use other learning material when using computers in class	11.7	8.8	11.2	15.3	11.6	16.0	13.9	12.5	11.1

Source: *LearnInd CTS 2006;* ***Base:*** *Teachers using computers in class;* ***Question:*** *Q10 "Which of the following types of materials have you used when teaching your main subject(s) with the aid of a computer and/or the internet?"*

Barriers to computer use in class in Norway 2006

Percentage of all teachers ***not*** *using computers in class*	Total NO	Total EU25	Educational Level				Type of locality		
			Primary	Lower secondary	Upper secondary	Vocational	Densely populated	Inter-mediate	Thinly populated
Lack of computers	49.9	48.8	*49.6**	*47.6**	*54.9**	*49.8**	*36.1**	*38.5**	57.1*
Lack of adequate content/material	33.0	20.3	*38.5**	*35.1**	*30.4**	*34.5**	*0.0**	*45.3**	37.9*
Lack of content in national language	7.2	8.6	*11.1**	*14.2**	*0.0**	*0.0**	*0.0**	*8.2**	8.8*
Lack of adequate skills of teachers	15.9	22.5	*20.4**	*19.9**	*8.8**	*16.4**	*0.0**	*19.2**	19.1*
No or unclear benefits	21.6	16.2	*26.3**	*30.6**	*11.2**	*8.3**	*20.5**	*29.5**	19.4*
Lack of interest of teachers	8.7	8.9	*3.9**	*12.7**	*15.3**	*8.3**	*0.0**	*25.8**	5.7*
Subject does not lend itself to being taught via computers	20.1	24.4	*11.6**	*15.3**	*38.7**	*40.1**	*15.8**	*29.6**	18.2*
Other	19.2	21.3	*22.6**	*17.9**	*4.1**	*9.1**	*27.5**	*16.4**	17.8*

Source: *LearnInd CTS 2006;* ***Base:*** *all teachers not using computers in class;* ***Question:*** *Q12: "Why do you not use computers and/or the internet when teaching in class?"* ***Notes:*** *"xx.x*": based on at least 10 and less than 50 cases.*

Attitudes on the Usefulness of ICT use in Teaching

Computers and the internet arrived in Norwegian schools quite some time ago.

The share of teachers in Norway – but also in the European Union in general – who believe that computers and the internet should not at all be used in schools, is very low but in Norway slightly higher than the European average of just below 1%.

Norwegian teachers have a positive attitude about the different applications of ICT in teaching but achieve figures which are in some cases significantly below the European average on attitudes that ICT should be used for letting pupils do exercises and practise (76%), letting pupils retrieve information in a self-directed manner (65%) and for collaborative and productive work by pupils (58%). There are only minor differences across school types.

A majority of Norwegian teachers (64%) still believes that teaching about office tools should be an integral part of the teaching process. With this figure, the country ranks around the EU25 average figure. This attitude is most prominent among teachers in primary schools (69%) and least prominent in vocational schools (50%). It is interesting that there is no common pattern across the European countries. Only in a few countries (the UK, Norway, Iceland, Cyprus and Spain) do teachers in primary schools express this opinion much more strongly and to a larger extent compared to higher-level schools.

Access, Competence and Motivation for Using ICT and the Internet in Schools

Access

A majority of Norwegian teachers are more or less satisfied with the technical access means at their schools: 80% state that their school is well equipped with computers and 83% express the opinion that their internet connection is fast enough. Highest satisfaction rates can be found in vocational schools (90%).

A very high 73% wish there were better support and maintenance actions taken. This is especially the case in primary schools with 76% of the teachers stating this as an issue.

Access to content of good quality is an issue in Norway. Considerable 48% state problems with respect to finding adequate learning materials and 49% argue that existing materials are of poor quality.

Competence in using ICT

Norwegian teachers feel most competent in using e-mail and using a text processor programme but are less confident with downloading and installing software and with using presentation software packages.

A very high number of teachers (64%) state that teachers in their school lack the necessary ICT skills.

Primary school teachers seem to be slightly less ICT competent than those in secondary and vocational schools.

Attitudes on the Usefulness of ICT use in Teaching in Norway 2006

Percentage of teachers saying computers/internet should be used for …	Total NO	Total EU25	Educational Level				Type of locality		
			Primary	Lower secondary	Upper secondary	Vocational	Densely populated	Inter-mediate	Thinly populated
Letting pupils do exercises and practise	75.7	79.9	77.2	69.6	79.3	79.0	72.0	77.3	76.1
Letting pupils retrieve information in a self-directed manner	65.0	85.0	63.0	69.5	67.1	65.6	69.3	73.9	62.4
Teaching about office tools	64.6	61.3	68.8	63.3	51.5	49.8	57.2	62.5	66.4
Collaborative and productive work by pupils	58.0	80.5	58.6	56.2	61.2	59.0	62.2	59.9	56.8
Computer/internet should not be used for any of these in teaching	1.6	0.6	1.5	1.2	3.9	1.7	3.0	0.0	1.7

Source: *LearnInd CTS 2006;* ***Base:*** *all teachers;* ***Question:*** *Q13: "What do you think for what computers and the internet should be used for in teaching?"*

Teachers' access, competence and motivation for using ICT in class 2006

Percentage of teachers agreeing or strongly agreeing:	Total NO	Total EU25	Educational Level				Subject of teaching					
			Primary	Lower secon-dary	Upper secon-dary	Vocational	General primary	Literature and languages	Humanities and social sciences	Science, maths, computer sciences	Physical, artistic, crafts education	Vocational education
Access												
Our school is well equipped with computers [a]	79.5	74.2	77.9	81.5	85.9	89.4	74.7	77.5	75.6	83.5	77.7	*88.5**
The internet connection we have is sufficiently fast [b]	83.4	77.2	81.5	83.0	88.9	89.6	82.3	82.6	87.1	84.0	82.1	*83.6**
Better technical maintenance and support is required in our school [c]	73.3	64.8	76.3	74.1	59.6	54.6	77.5	73.6	75.5	70.9	79.7	*41.0**
Existing teaching materials on the Internet are of poor quality [d]	48.6	29.9	49.8	48.6	43.7	44.9	49.7	46.5	50.4	46.8	54.7	*46.7**
It is hard to find adequate learning materials for teaching [e]	48.3	38.7	49.1	47.9	40.0	43.2	49.6	45.6	52.5	48.4	47.6	*47.2**
Motivation												
Pupils are more motivated and attentive when computers and the internet are used in class [f]	89.8	86.3	92.8	91.5	73.3	74.7	89.0	91.3	92.5	90.8	88.1	*74.4**
Using computers in class does not have significant learning benefits for pupils [g]	16.7	20.7	14.9	16.4	27.5	25.0	12.9	15.9	15.3	18.7	17.6	*18.7**
Competence												
Teachers in our school do not have sufficient computer skills [h]	63.8	42.0	66.0	61.5	59.1	59.9	69.9	64.4	66.6	61.4	65.8	*65.5**
Competence / computer skills (Percentage of teachers who feel very confident at…)												
Using text processors [i]	67.8	65.0	67.8	70.2	69.5	64.8	58.6	68.5	69.0	69.6	76.1	*52.3**
Creating electronic presentations [j]	32.4	34.0	30.1	30.3	43.8	47.1	23.1	30.0	35.2	34.1	33.4	*49.2**
Using e-mail [k]	79.3	65.9	76.9	79.1	85.7	86.2	71.3	78.7	80.3	79.1	86.4	*85.5**
Downloading and installing software [l]	36.8	35.8	38.0	35.8	40.6	39.9	24.9	34.9	30.9	40.6	42.5	*33.1**

Source: *LearnInd CTS 2006;* ***Base:*** *a-h All teachers; i -l Teachers using computers in class* ***Question:*** *a-h Q14, i-l Q11.* ***Notes:*** *"xx.x*": based on at least 10 and less than 50 cases.*

Motivation for ICT use in Schools

90% of Norwegian teachers see significant learning benefits for pupils using computers in class and say that pupils are more motivated and attentive when computers and the internet are used in class. A high 83% state that the use of ICT in class results in significant learning benefits for pupils.

ICT Readiness of Teachers – the ACM Model

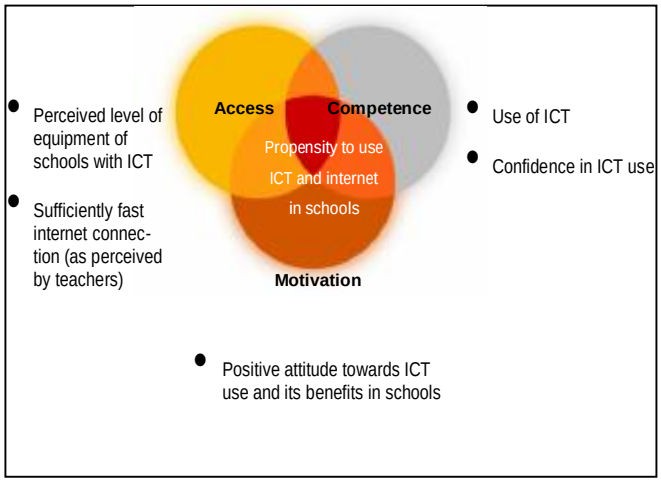
The ACM model as developed by Viherä and Nurmela (2001)[3] was applied in LearnInd to generate a typology according to the "propensity to the use of computers and internet by teachers in classroom situations at schools".

The typology in the figure below takes account of the three main categories of preconditions which need to be given for a school to make use of computers and the internet in the teaching process in classrooms, computer labs etc.

These are: access (to computers and the internet at school), competence (in using the computer software and the internet, and applying it for teaching purposes), and motivation (gauged through the attitude that using computers in classrooms results in significant learning benefits).

Any attempt to group the classroom teachers according to their propensity to becoming users of computers and the internet in their teaching processes needs to take account of these three dimensions. In the present application of the ACM model data from the Classroom Teacher Survey (CTS) was used. Therefore "access" for instance is to be understood as a perceived level of computer equipment at schools and teachers' satisfaction therewith rather than an objective measure of equipment status.

The Access-Competence-Motivation Model



38% of European teachers dispose of sufficient access to the internet at school, the necessary competence in using ICT in class and are motivated to its use. With 49% of the teachers belonging to this group, Norway ranks at 5th which places the country in the top quarter of European countries. Overall the UK with 60% ranks top and Latvia with 15% finds itself at the very end.

The as yet insufficient internet connection in many schools and a lack of motivation of teachers for using ICT are the most critical issues for a wider uptake of computers and the internet in schools in Europe. 20% of European teachers indicate insufficient computer equipment and the low speed of internet connection at their school as key barriers. 14% show a lack of motivation, i.e., they are of the opinion that using computers in class does not result in significant learning benefits.

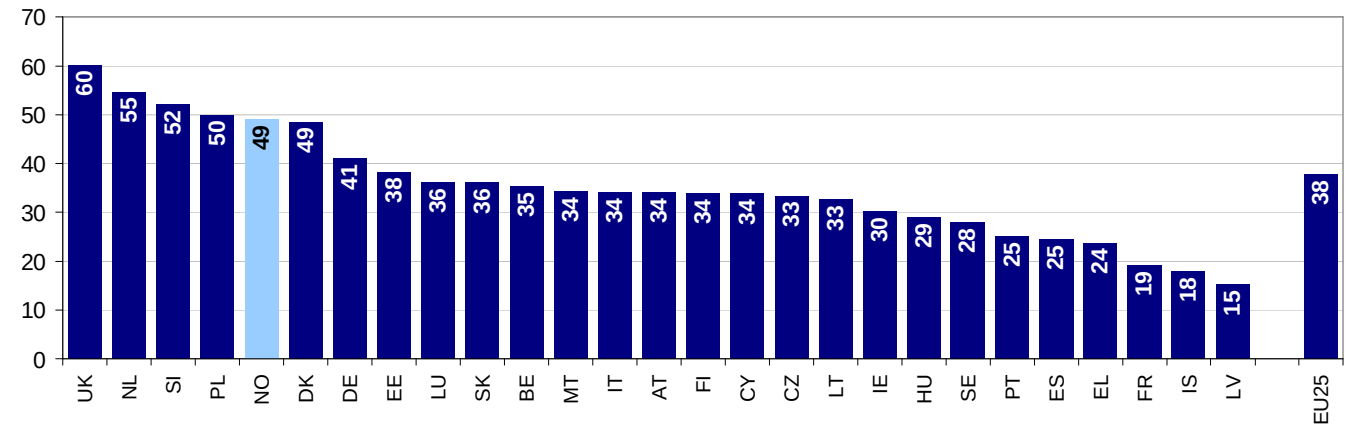
The situation in Norway is very similar to the overall situation in the EU25 with figures very close to the European ones on lack of access to ICT in schools (20% compared to 21% for the EU25) and lack of motivation of teachers (14% for both, Norway and the EU25) when using the ACM model. The former comes as a surprise and needs to be treated with some caution since the ICT equipment of schools in Norway is in fact very good. However and as already mentioned above a very high number of teachers (73%) demand better ICT maintenance and support in their schools, pointing to an area where there is some need for improvement in Norwegian schools.

Access, Motivation and Competence of Teachers for Using ICT in Schools in Norway 2006

NO	EU25	Access	Competence	Motivation
2.6	4.3	~~Access~~	~~Competence~~	~~Motivation~~
2.6	3.9	**Access**	~~Competence~~	~~Motivation~~
7.6	9.7	~~Access~~	**Competence**	~~Motivation~~
1.5	5.0	~~Access~~	~~Competence~~	**Motivation**
14.2	13.7	**Access**	**Competence**	~~Motivation~~
2.2	4.8	**Access**	~~Competence~~	**Motivation**
20.2	20.7	~~Access~~	**Competence**	**Motivation**
49.1	37.9	**Access**	**Competence**	**Motivation**
100	100			

Percentage of teachers. ***Source:*** *LeanInd CTS 2006;* ***Base:*** *All teachers;* ***Question:*** *See endnote* [4]

ICT Readiness of Teachers in Norway: Percentage of Teachers Fully Ready to use Computers in Class (ACM Indicator) 2006



Source: *LeanInd CTS 2006;* ***Base:*** *All teachers.* ***Question:*** *See endnote 5*

ANNEXES

Methodology Report

Universe / Sample population

In order to assure the comparability of school levels in all countries UIS-OECD-EUROSTAT "Mapping of national education programmes to ISCED 97 for school academic/year 2002/2003" [5] was used for composing the sample frame. Based on this, each country divided its school system into ICSED codes and made different combinations that existed in its country.

Sampling frame and method

The sample was composed using official databases, which contained contact data of schools. In the majority of countries the sample was drawn from a database received from the Ministry of Education.

For each country a separate template of sample frames was composed by TNS Emor. These templates contained data about school types across regions as well as location type. School types were defined based on the ISCED codes provided in UIS-OECD-EUROSTAT. Location type distribution was made according to the Eurostat type of locality classification which differentiates densely populated, intermediate and thinly populated municipalities[6]. Apart from that, each country was divided into 3-7 regions depending on the size of a country.

Based on the data provided by countries, TNS Emor composed quotas for each country. Two level stratification was used – quotas for first stage, random sample for second. The quotation for region by school type and location type was endorsed. Simple random selection was conducted by the local agency or the local source of the contact base. Both private and public schools were included in the sample. It was also obligatory to include schools of other teaching languages than the official language of a country in the sample.

Simple random sampling was used inside a quota cell. This means that if the quota for primary schools in region1 was 100 and the total number of primary school in this region was 800, then a random sample selection was be made among those 800 schools. This covered both private and public schools and schools of other teaching languages than the official language of a country.

No more than 50% of interviews could be made in one school level. At least 10% of respondents had to be from schools which provided professional/vocational or combined programme of vocational and upper secondary level education (in case a country did not have special quota for those schools). It did not matter whether vocational education level was coded as ISCED 3 or ISCED 4.

There were no duplications in samples of head teacher and classroom teacher surveys. This was only allowed in countries with small universe sizes (e.g. Malta, Cyprus, Iceland, Estonia, Latvia etc) and in cases where the last quota cells were very difficult to achieve or there were not enough schools of a certain type. The priority was to include as many different schools as possible. In both surveys, 5 attempts were made before giving up and only if the respondent refused was this person not contacted again.

The CATI programme generated a randomly chosen letter. The interviewer asked for the person with a surname that started on the generated letter. If there was more than one teacher whose surname started with the selected letter, the person who was first alphabetically was chosen. If the correct person was not available, an appointment was made. At least 5 attempts were made before taking another teacher.

Only in Malta, due to instructions dictated by the Education Department, would the Head Teacher randomly select a teacher that would be available for an appointment during which they would be interviewed.

Number of interviews conducted (HTS / CTS)

Country		Head Teachers	Classroom teachers
BE	Belgium	450	807
CZ	Czech Republic	500	1000
DK	Denmark	315	848
DE	Germany	450	901
EE	Estonia	400	851
EL	Greece	500	1000
ES	Spain	518	1022
FR	France	501	869
IE	Ireland	403	626
IT	Italy	500	900
CY	Cyprus	150	600
LV	Latvia	451	902
LT	Lithuania	457	908
LU	Luxemburg	82	277
HU	Hungary	500	1000
MT	Malta	100	200
NL	Netherlands	515	890
AT	Austria	320	450
PL	Poland	500	1000
PT	Portugal	450	900
SI	Slovenia	253	460
SK	Slovakia	502	1000
FI	Finland	318	601
SE	Sweden	200	450
UK	United Kingdom	450	905
IS	Iceland	177	424
NO	Norway	494	708
TOTAL		**10456**	**20499**

Fieldwork

Fieldwork was coordinated by the TNS Emor and conducted in cooperation with its local TNS offices excluding Iceland, Cyprus, Austria, Slovenia and Malta where TNS does not have offices. In these countries partners with whom TNS had previous experience were used.

Pilot interviews prior to the regular fieldwork were conducted with 20 schools in both target groups in Estonia and Greece in February 2006, in order to test the questionnaire (structure, comprehensibility of questions).

Between March and April 2006, surveys among head teachers (head teacher survey - HTS) and classroom teachers (CTS) were carried out in 27 European countries. TNS Emor was responsible for the fieldwork.

Weighting schemes

After the fieldwork, weighting coefficients were computed using region, location type and school type.

Statistical accuracy of the survey: confidence intervals

Statistics vary in their accuracy, depending on the kind of data and sources. A "confidence interval" is a measure that helps to assess the accuracy that can be expected from data. The confidence interval is the estimated range of values on a certain level of probability of error. Confidence intervals for estimates of a population fraction (percentages) depend on the sample size, the probability of error, and the survey result (value of the percentage) itself. Further to this, variance of the weighting factors has negative effects on confidence intervals.

The calculation of confidence intervals is based on the assumption of (quasi-) infinite population universes. In practice, however, in some countries and for some school levels the complete population of schools consists of only several hundred or even a few dozen of schools. In some cases, literally each and every school within a country-school type cell was contacted and asked to participate in the survey. This means that it is practically impossible to achieve a higher confidence interval through representative school surveys in which participation is not obligatory.

Country Background Data

In Norway, a total of 16.2% of GDP is spent on education. This is a top value in Europe. The very high GDP per capita is only exceeded by Luxembourg. The pupil/teacher ratio is one of the lowest of all member states, although Norway spends less than other countries on secondary education.

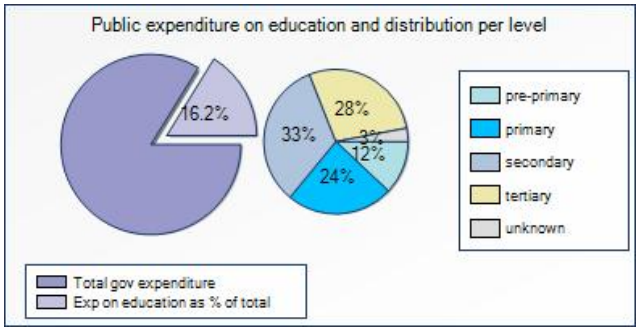
General Population Data for Norway 2002/03[7]

Total population (000)	4,514
Annual population growth rate (%)*	0.6
Population 0-14 years (%)	20
Rural population (%)*	25
Total fertility rate (births per woman) *	1.8
Infant mortality rate (0/00) *	4
Life expectancy at birth (years) *	79
GDP per capita (PPP) US$ *	37,148
GDP growth rate (%)*	1.4
* World Bank World Development Indicators	

Resources for Education in Norway 2002/03

Pupil / teacher ratio (primary)	10
Public expenditure on education :	
as % of GDP	7.6
as % of total government expenditure	16.2
Distribution of public expenditure per level (%):	
pre-primary	12
primary	24
secondary	33
tertiary	28
unknown	3

Resources for Education in Norway 2002/03



The Educational System in Norway[8]

In 2003/04, there were 620,000 pupils in compulsory education (grade 1-10) – close to 100% of the population in the age group 6-16 years. There are almost 200,000 pupils in upper secondary education, and nearly 210,000 students in tertiary education. There are two official Norwegian written languages, *Bokmål* and *Nynorsk*; each municipality decides which language is used in its schools. The minority *Sami* language is used in schools in *Sami* speaking areas.

In 2003/04, 98% of all pupils in primary and lower secondary education attended public-sector institutions, and at upper secondary level some 95% attended public sector institutions. The remaining pupils attended private institutions, and most of them have 85% of their expenses covered by the government. The share of students in public (i.e. state) tertiary education is approximately 90%.

Education supervision is exercised at three levels. The Ministry of Education and Research, assisted by advisory bodies including County Governors in each county, has overall responsibility for all areas of education except pre-school provision, which is the responsibility of the Ministry of Children and Family Affairs. Municipality authorities manage all aspects of compulsory education, county authorities are responsible for upper secondary education, and the Ministry of Education and Research manages the tertiary education institutions directly.

The Ministry of Education and Research has ultimate responsibility for supervision of education and discusses this with County Governors in each county, who also have a responsibility for coordinating local guidance and development work. As from June 2004 a new Directorate for Primary and Secondary Education has the responsibility for the production of national curricula, supervision/control and development of primary and secondary education.

The use of ICT in Education[9]

The Norwegian Ministry of Education and Research has launched a multi-annual Programme for Digital Literacy (2004-2008). The programme intends to address two major challenges.

Firstly, information and communication technologies (ICT) will have to be integrated in the learning process. This requires a better balance between access to technology and the actual exploitation of new technologies. It is a major challenge for the education systems of tomorrow to implement digital literacy as a natural part of daily learning at all levels of education. ICT must no longer be considered a tool for particularly interested students.

Second, success factors, obstacles and examples of good practice for the education sector will be demonstrated. The programme is a trans-sector one and addresses the entire education sector, primary and secondary education, higher education and adult learning. It focuses on the impact of ICT on the quality of education, the motivation for learning, learning methods and learning effect. It concentrates on the development of tools that over time will measure and analyse quantitative and qualitative features of the development of ICT and learning.

The Study

There is a lack of information on the actual use of ICT for learning in schools and for supporting political action in potential future programmes. It is necessary to clarify matters such as the educational vision of heads of schools, the current impact of ICTs on teachers' practice, support and training and on other factors for success in e-learning.

The objective of the study is to obtain estimates for the eEurope 2005 indicator on e-learning "number of pupils per computer with Internet connection (broadband/non-broadband)" and relate it to other possible indicators of educational use of ICT in compulsory education (e-learning in schools). The study looks at how Information and Communication Technologies (ICT) are used in schools.

The study is a continuation of the earlier benchmarking exercise for eEurope 2002.

It involved two surveys. Firstly of head teachers to obtain information on the schools and then of teachers to focus on their use of ICTs in the teaching process

This exercise is part of the Information Society monitoring and benchmarking process for which the Commission in cooperation with the Council defined benchmarking indicators.

Country Briefs

This document has been prepared by **empirica** based on own desk research and the above mentioned primary data sources: Head Teacher Survey (HTS) 2006 and Classroom Teacher Survey (CTS) 2006 in the EU25 member states, Iceland and Norway.

Altogether 27 LearnInd Country Briefs are available in a common format, one for each member of the enlarged European Union, Norway and Iceland.

A final report has also been developed. It includes approximately 100 exhibits, more than 250 data tables and a report about the key results.

You can access and download these documents in PDF format (for free) from http://ec.europa.eu/information_society/eeurope/i2010/benchmarking/index_en.htm.

More information

Check our results and achievements on: http://ec.europa.eu/information_society/eeurope/i2010/benchmarking/index_en.htm. If you wish to be provided with more details, or to receive news and updates, please contact us at: **learnind@empirica.com** or get in touch with us.

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1 Note that "in class" means during lessons while teaching and does not denote a particular location such as a classroom.

2 Base (100%) = all teachers who have used a computer in class in the last 12 months.

3 Viherä, M-L, Nurmela, J (2001) "Communication Capability Is an Intrinsic Determinant for Information Age", in Futures, Volume 33, Issue 3-4:245-265.

4 Synthetic indicators: Access: Q14 (2) "Our school is well equipped with computers" and Q14 (3) "The internet connection we have is sufficiently fast ".

Competence: Q11 How confident do you feel... a) using a text processor, b) creating a presentation c) using e-mail, d) downloading and installing software. Threshold: Average of 2.5 or more on a 1-4 confidence scale

Motivation: Q14 (8); disagree with "Using computers in class does not result in significant learning benefits".

For full question wordings refer to questionnaire.

5 http://forum.europa.eu.int/Public/irc/dsis/edtcs/library?l=/public/unesco_collection/programmes_isced97&vm=detailed&sb=Title

6 Densely populated area refers to a set of closely related local units, each one of which having a density greater than 500 inhabitants per km2, and the total population of which being of at least 50 000 inhabitants; Intermediate area refers to a set of closely related local units that do not pertain to a densely populated area, each one of which having density greater than 100 inhabitants per km2, and where the total population is at least of 50 000 inhabitants or it refers to a set that is adjacent to a highly populated area. Thinly populated area (rural): refers to a set of closely related local units that are not part of a densely populated area, or of an intermediate area. (A set of local areas totalling less than 100 km², not reaching the required density, but entirely enclosed within a densely-populated or intermediate area, is to be considered to form part of that area. If it is enclosed within a densely-populated area and an intermediate area it is considered to form part of the intermediate area).

7 Source: http://www.uis.unesco.org/profiles/selectCountry_en.aspx (visited 28 March 2006)

8 Source: http://www.eurydice.org/Documents/struct2/frameset_EN.html (visited: 28 March 2006)

9 Source: http://europa.eu.int/comm/education/policies/2010/nationalreport_en.html (visited: 9 May 2006)